

# HEATING AND ACCESSORIES

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## TEMPEST HEATER

### GENERAL DESCRIPTION

Pontiac's Tempest Heating and Defroster System provides rapid warm-up sensation and even distribution of warmed air to all parts of the car. All air entering the system is taken through hood high cowl duct providing air with a minimum of dust, foreign material and undesirable fumes.

The use of outside air exclusively provides constant and rapidly changing air inside the car, eliminating a smoke-filled interior and keeps the occupants comfortable.

The driver has fingertip temperature control of the air entering the car. When heated air is desired, the driver forces air taken from the hood high cowl air duct through the heater core and then through the air distributing system to the air outlets.

The design of the heater and defroster system, its controls and controls permits a method of obtaining different amounts of forced air flow for ventilation.

### OUTLETS AND CONTROLS (Fig. 12-1)

#### OUTLETS

Warmed air enters the interior of the car and is distributed by a center outlet grille opening at the

bottom of the heater duct, which disperses air over the front floor area and is so aimed that it also directs air to the rear passenger compartment.

Additional outlets are provided on the right and left sides of the heater outlet air duct for additional air distribution to the driver and front passenger floor area.

#### CONTROL PANEL

The heater control panel (Fig. 12-2) is located to the right of the steering column. The panel has two levers sliding in a horizontal plane which control air flow and temperature. When these levers are in the extreme left position, all valves and control units are closed. The blower speed is controlled by a switch located to the left of the temperature and air levers.

#### FAN CONTROL

The fan control lever has four distinct positions - OFF, LO, MED, and HI; HI is in the full up position, LO and MED partially down, and OFF in the full down position (Fig. 12-3).

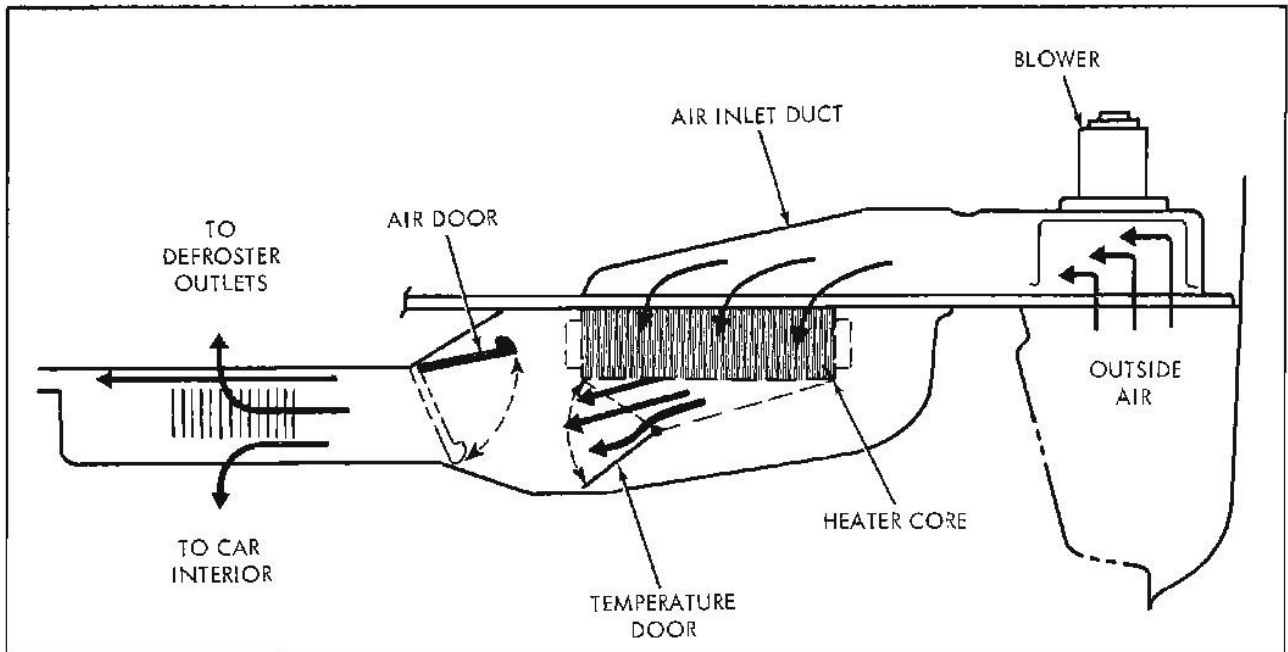


Fig. 12-1 Air Flow - Heater System

### TEMPERATURE CONTROL

When the temperature control lever is in the extreme left position the heater air valve is closed preventing heat from entering the passenger compartment. As the lever is moved progressively to the right, more and more air is introduced through the heater core. In the full right position, maximum heat is obtained if the air control lever is positioned in NORMAL or DEFROST detent.

With the air control lever in the NORMAL detent, slide the temperature control to the full right position during engine warm up. After the inside of the car is at the desired temperature level, adjust the temperature lever to maintain this temperature.

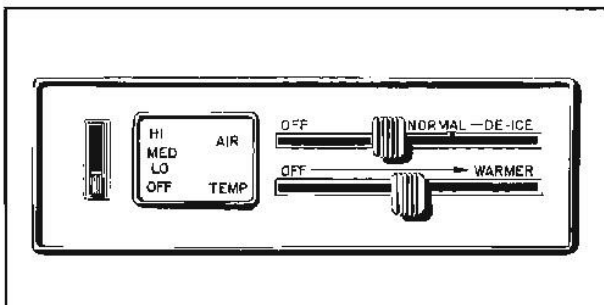


Fig. 12-2 Heater Control Panel

### AIR CONTROL

With the air lever in the extreme left position very little air will enter through the heater system. As the lever is moved to NORMAL or DEFROST detent, outside air is introduced through the heater air system.

NORMAL detent position permits partial air flow out of the defroster nozzles while providing the majority of air flow through the heater air system.

Moving the air control lever to the right from the NORMAL detent position to the DEFROST detent position permits air to be directed to the windshield.

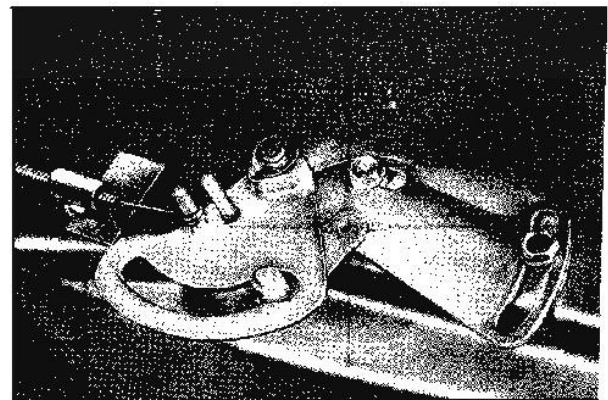


Fig. 12-3 Temperature Control Cable Adjusting Pin in Position

with only a limited amount of air coming out of the heater outlets.

### TIPS ON USE OF HEATER AND DEFROSTER SYSTEM

#### KEEPING COMFORTABLE IN EXTREMELY HUMID "MUGGY" WEATHER

When the relative humidity is extremely high causing discomfort on a day when the temperature is 55°F.-70°F., move the air control lever to the mid-way position (normal) and move the temperature control lever to the right slightly. This will permit outside air to enter the heater core and provide minimum heating. Move the fan control lever to the low speed position.

#### KEEPING COMFORTABLE IN MILD WEATHER

When the weather is cool, but the sun is very bright, as in spring or fall or at high altitudes, use both the heater and the cowl ventilators at the same time, positioning the air control lever at NORMAL detent and setting the temperature control and fan speed for desired comfort.

#### CONTROLLING TEMPERATURE IN CAR

The most satisfactory method of controlling the temperature in the car is to:

1. Set air control lever to the right for maximum air flow (normal detent).
2. Position temperature control lever to the extreme right for maximum heating, then adjust to maintain the desired temperature in the car.
3. Set fan speed for your personal comfort.

#### USING THE HEATING SYSTEM FOR VENTILATION

The heating system is designed so that it can also be used for ventilation when it is not necessary to warm the air. Ventilation may be obtained by placing the air control lever in the NORMAL detent position for maximum air flow and the temperature control lever in the extreme left (OFF) position to prevent the air from passing over the heater core. Select the amount of air flow desired by positioning the fan control lever at the speed desired.

## MINOR ADJUSTMENTS

### TEMPERATURE CONTROL CABLE

*NOTE: Some warming of air is normal even though temperature lever is at OFF. Cable should be connected securely at both ends before adjusting.*

1. Remove glove box.
2. Place temperature control lever in OFF position.
3. Adjust turnbuckle as necessary to allow 3/16" diameter gauge pin to pass freely from control cam into bracket on heater case (Fig. 12-3).
4. With gauge pin in place adjust turnbuckle to move control lever against end of slot in control panel, then turn in the opposite direction to move control lever 1/16 to 1/8 inch away from end of slot.
5. Remove gauge pin.
6. Move temperature lever to full heat then back to OFF and recheck to make sure gauge pin fits freely in index holes.
7. Replace glove box.

### AIR CONTROL CABLE

1. Place air control lever in OFF POSITION.
2. Hold outside air door lever on heater case in closed position.
3. Holding air door lever in off position, adjust turnbuckle to move control lever to full OFF position against end of slot in control panel, then turn in opposite direction to move control lever 1/16 to 1/8 inch from end of slot.
4. Operate lever to DE-ICE position, then back to OFF and check to see that there is a slight spring back from end of slot not to exceed 1/8".

### DEFROSTER CONTROL CABLE

1. Place air control lever in DE-ICE position.
2. Hold de-ice door lever in open (de-ice) position.

3. While holding door open, adjust turnbuckle to move control lever against end of slot in control panel, then turn in opposite direction to move control lever 1/16 to 1/8 inch from end of slot.

4. Operate control lever to OFF then back to DE-ICE and check to see that there is a slight spring back from end of slot not to exceed 1/8".

### MAJOR REPAIRS

#### HEATER CONTROL PANEL ASSEMBLY— REMOVE AND REPLACE (Fig. 12-4)

1. Disconnect battery.
2. Remove radio.
3. Disconnect wires from blower control switch and control cables from heater core and case assembly.
4. Remove two stamped nuts at bottom and two at top from backside of heater control assembly.
5. Remove control assembly and remove cables.
6. Replace by reversing the above procedure.
7. Adjust air control bowden cable.
8. Adjust temperature control bowden cable.
9. Adjust defroster control bowden cable.
10. Connect battery.

#### HEATER FAN (BLOWER) SWITCH— REMOVE AND REPLACE

1. Disconnect battery.
2. Remove radio.
3. Disconnect wires from blower switch.
4. Remove blower switch from control assembly.
5. Replace by reversing the above procedure.

#### TEMPERATURE CONTROL CABLE— REMOVE AND REPLACE

1. Remove glove box.

2. Remove temperature control bowden cable from heater core and case assembly.

3. Remove temperature control bowden cable from control assembly.

4. Replace by reversing the above procedure

5. Adjust the temperature control bowden cable

6. Replace glove box.

#### AIR CONTROL CABLE—REMOVE AND REPLACE

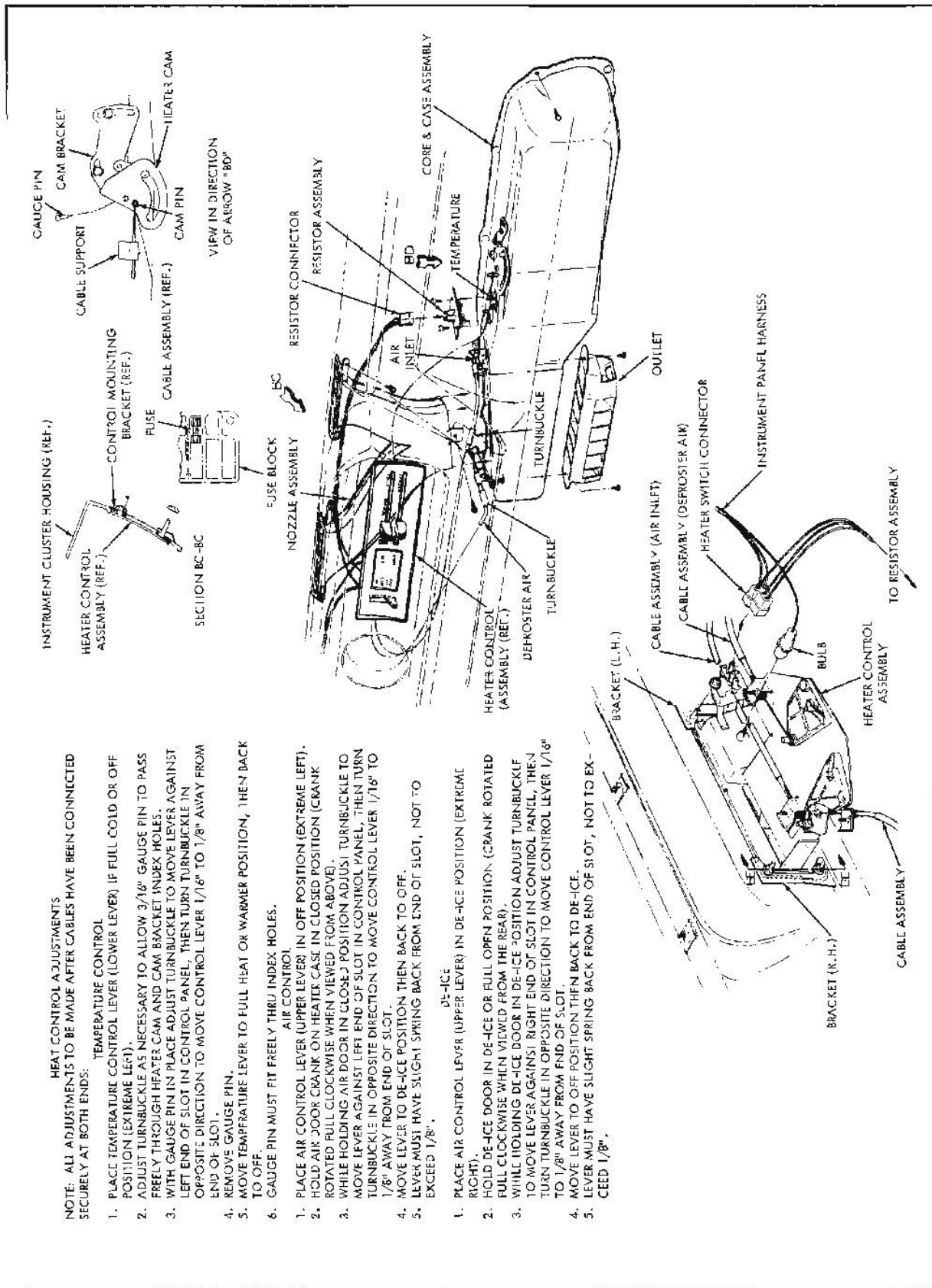
1. Remove radio.
2. Remove air control bowden cable from heater core and case assembly.
3. Remove air control bowden cable from control assembly.
4. Replace air control bowden cable.
5. Adjust air control bowden cable.
6. Replace radio.

#### DEFROSTER CONTROL CABLE— REMOVE AND REPLACE

1. Remove radio.
2. Remove defroster control bowden cable from heater core and case assembly.
3. Remove defroster control bowden cable from control assembly.
4. Replace defroster control bowden cable.
5. Adjust defroster control bowden cable.
6. Replace radio.

#### BLOWER MOTOR OR AIR INLET DUCT ASSEMBLY— REMOVE AND REPLACE (Fig. 12-5)

1. Hoist front end of car.
2. Remove right front wheel assembly.
3. Remove right front headlamp assembly.



- HEAT CONTROL ADJUSTMENTS**  
 NOTE: ALL ADJUSTMENTS TO BE MADE AFTER CABLES HAVE BEEN CONNECTED SECURELY AT BOTH ENDS:
- TEMPERATURE CONTROL**
1. PLACE TEMPERATURE CONTROL LEVER (LOWER LEVER) IF FULL COLD OR OFF POSITION (EXTREME LEFT).
  2. ADJUST TURNBUCKLE AS NECESSARY TO ALLOW 3/16" GAUGE PIN TO PASS FREELY THROUGH HEATER CAM AND CAM BRACKET INDEX HOLES.
  3. WITH GAUGE PIN IN PLACE ADJUST TURNBUCKLE TO MOVE LEVER AGAINST LEFT END OF SLOT IN CONTROL PANEL, THEN TURN TURNBUCKLE IN OPPOSITE DIRECTION TO MOVE CONTROL LEVER 1/16" TO 1/8" AWAY FROM END OF SLOT.
  4. REMOVE GAUGE PIN.
  5. MOVE TEMPERATURE LEVER TO FULL HEAT OR WARMER POSITION, THEN BACK TO OFF.
  6. GAUGE PIN MUST FIT FREELY THRU INDEX HOLES.
- AIR CONTROL**
1. PLACE AIR CONTROL LEVER (UPPER LEVER) IN OFF POSITION (EXTREME LEFT).
  2. HOLD AIR DOOR CRANK ON HEATER CASE IN CLOSED POSITION (CRANK ROTATED FULL CLOCKWISE WHEN VIEWED FROM ABOVE).
  3. WHILE HOLDING AIR DOOR IN CLOSED POSITION ADJUST TURNBUCKLE TO MOVE LEVER AGAINST LEFT END OF SLOT IN CONTROL PANEL, THEN TURN TURNBUCKLE IN OPPOSITE DIRECTION TO MOVE CONTROL LEVER 1/16" TO 1/8" AWAY FROM END OF SLOT.
  4. MOVE LEVER TO DE-ICE POSITION THEN BACK TO OFF.
  5. LEVER MUST HAVE SLIGHT SPRING BACK FROM END OF SLOT, NOT TO EXCEED 1/8".
- DE-ICE**
1. PLACE AIR CONTROL LEVER (UPPER LEVER) IN DE-ICE POSITION (EXTREME RIGHT).
  2. HOLD DE-ICE DOOR IN DE-ICE OR FULL OPEN POSITION. (CRANK ROTATED FULL CLOCKWISE WHEN VIEWED FROM THE REAR).
  3. WHILE HOLDING DE-ICE DOOR IN DE-ICE POSITION ADJUST TURNBUCKLE TO MOVE LEVER AGAINST RIGHT END OF SLOT IN CONTROL PANEL, THEN TURN TURNBUCKLE IN OPPOSITE DIRECTION TO MOVE CONTROL LEVER 1/16" TO 1/8" AWAY FROM END OF SLOT.
  4. MOVE LEVER TO OFF POSITION THEN BACK TO DE-ICE.
  5. LEVER MUST HAVE SLIGHT SPRING BACK FROM END OF SLOT, NOT TO EXCEED 1/8".

Fig. 12-4 Reference Illustration - Body Interior Details

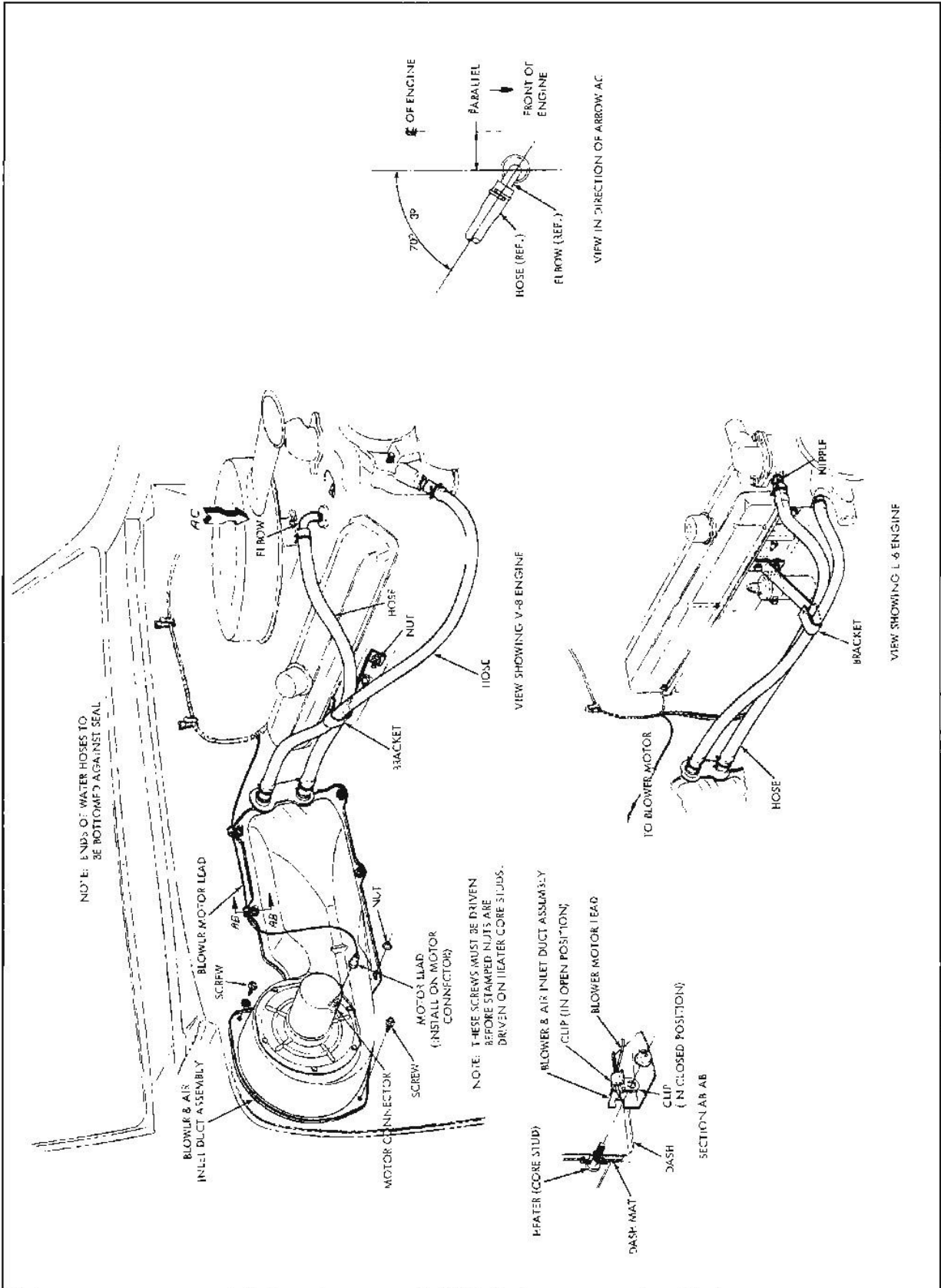


Fig. 12-5 Reference Illustration - Heater Parts in Engine Compartment

4. Remove right front fender assembly.
5. Disconnect wire at blower motor.
6. If blower motor only is to be replaced, remove five attaching screws and remove assembly.
7. If air inlet duct assembly is to be replaced, remove two attaching screws and five attaching nuts and remove assembly.
8. Replace by reversing the above procedure.

**HEAT CORE AND CASE—REMOVE AND REPLACE**

1. Drain radiator and remove glove box.
2. Disconnect heater inlet and outlet water hoses at heater.
3. Disconnect control cables at heater core and case assembly.
4. Remove wire connector from resistor assembly at top left side of heater air outlet duct assembly by prying connector up with a flat blade screwdriver.
5. Remove six nuts securing heater to air inlet duct assembly and remove heater assembly.
6. Remove heater core and case assembly.
7. Replace by reversing above procedures.
8. Adjust control cables.

**OPERATING INSTRUCTIONS**

To warm a car under various weather and driving conditions, use the following control settings after the engine has reached its normal operating temperature.

CONTROL	SETTING
Fan control lever . . . . .	full up for high speed
Temperature control lever	extreme right, for maximum heating, then adjusted for occupant comfort

CONTROL	SETTING
Air control lever . . . . .	extreme right until windshield is "de-iced" or "de-fogged", then to midway position for maximum air flow at heater outlets and partial defrost
Car windows . . . . .	front door vent and door window open slightly to assist in de-icing or de-fogging, then closed or positioned to provide comfort for all occupants

Side cowl ventilators . . . closed

**SLOW CITY DRIVING IN COLD WEATHER**

CONTROL	SETTING
Fan control lever . . . . .	full up for high speed
Temperature control lever	extreme right for maximum heating, then adjusted for comfort
Air control lever . . . . .	at midway position for maximum air flow and partial defrost

Car windows . . . . . closed

Side cowl ventilators . . . closed

**NORMAL COOL WEATHER HIGHWAY CRUISING**

CONTROL	SETTING
Fan control lever . . . . .	full up for high speed
Temperature control lever	position to obtain desired temperature
Air control lever . . . . .	at midway position for maximum air flow and partial defrost

Car windows . . . . . closed, door vent(s) may be opened to suit occupant comfort

Side cowl ventilators . . . closed

**COLD WEATHER HIGHWAY CRUISING**

**CONTROL**                      **SETTING**

Fan control lever . . . . full up for high speed

Temperature control lever extreme right for maximum heating, then adjusted for occupant comfort

**CONTROL**

**SETTING**

Air control lever . . . . at midway position for maximum air flow and partial defrost

Car windows . . . . . closed

Side cowl ventilators . . . closed

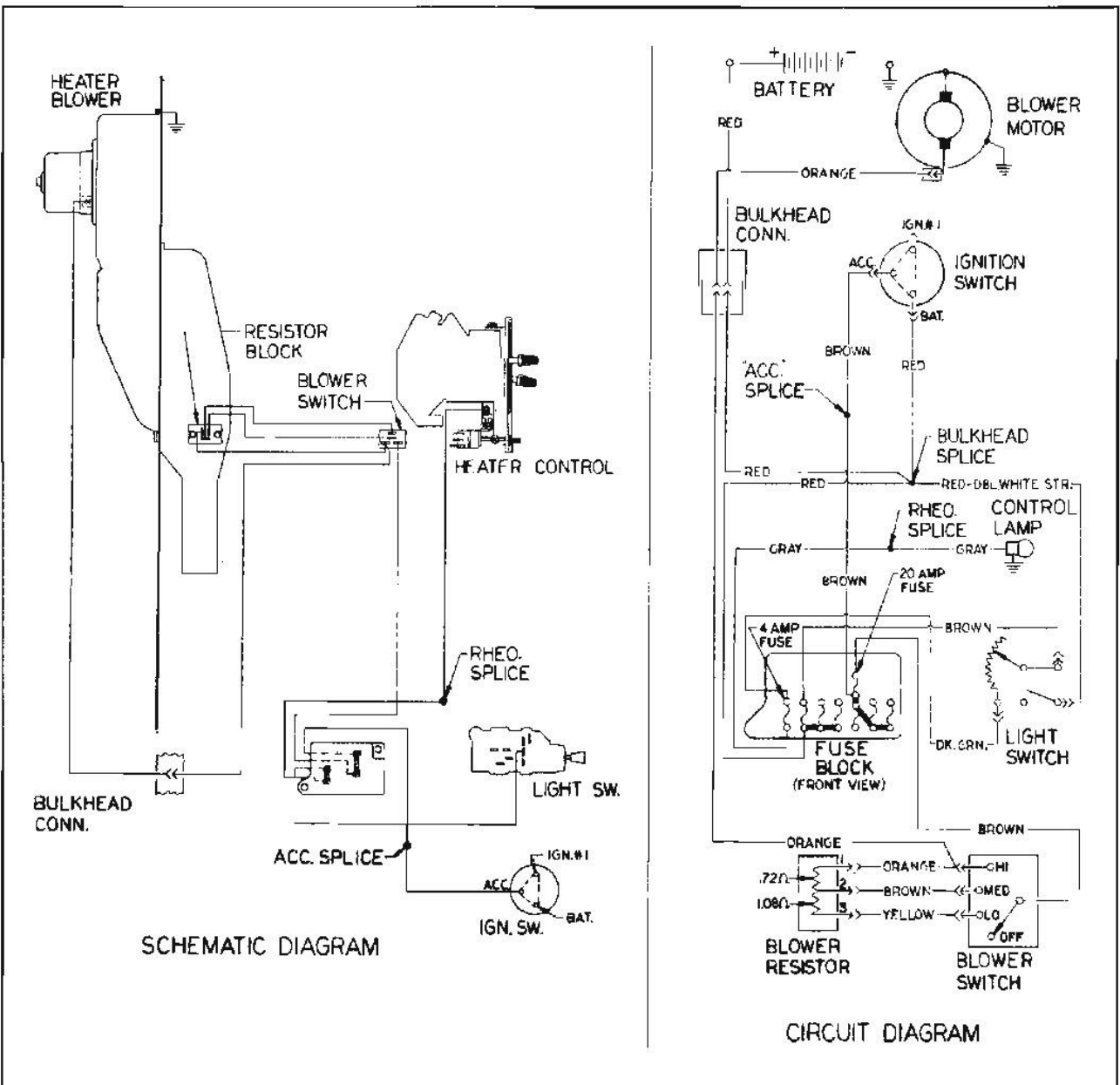


Fig. 12-6 Schematic and Circuit Diagram of Heater Electrical System



**TESTING****OPERATIONAL TEST**

The purpose of performing a heater operational test is to prove the heater system is operating properly.

**PRELIMINARY CHECKS**Engine Compartment

1. Check radiator for proper engine coolant level.
2. Inspect radiator core and heater hoses for leaks, at the same time inspecting for kinked or collapsed heater hoses.
3. Inspect the blower to heater air distributor to see that it is properly installed (to prevent any air leaks from engine compartment, which may have objectionable fumes or odors).

Inside Car Body

1. Check to see that control levers operate smoothly, and they are in alignment when all are in off position.
2. Start engine.

3. Place "FAN" control lever in OFF position; blower should not operate.

4. Move "FAN" lever to the LO and MED position; blower should operate. Continue by moving lever to the HI position; blower should operate at a speed faster than at LO and MED positions.

5. Move AIR lever slowly to the right until the normal detent is reached (slightly to right of center); more and more air should flow through outlet as lever is moved.

6. Move "AIR" lever slowly until the extreme right position is reached, at the same time sensing the amount of air flowing from the defroster outlets. More and more air should flow through these outlets as the lever is moved to the right.

7. After engine has warmed up, move "TEMP" control lever from the extreme left to the extreme right position. Air at outlet should get progressively warmer.

Should the heater control levers operate satisfactorily during the above checks, it would appear that heater controls operation is normal. If during the checks irregularities are noted or complaints on heater operation could not be noted or determined, then refer to TROUBLE DIAGNOSIS for the complaint or cause and the remedy.

**HEATER TROUBLE DIAGNOSIS****INSUFFICIENT HEATING**

COMPLAINT OR CAUSE	REMEDY
Not warming in car.	Incorrect operation of controls. Advise operator of proper operation of heater controls.
Objectionable engine or exhaust fumes in car.	Check for good seal between hood and cowl. Check for good seal between vent grille and cowl. Locate and seal any other air leaks.
Drafts on floor.	Check operation and adjustment of cowl vent cables. Check adjustment of air valve cable. Advise operator of proper operation of heater system.
Insufficient heat to rear seat.	Check for obstructions under front seat. Advise owners to operate blower.
Low engine coolant level.	Check radiator and fill to proper level, run engine to clear air lock.

**INSUFFICIENT HEATING (Continued)**

COMPLAINT OR CAUSE	REMEDY
Failure of engine cooling system to warm up.	Check radiator cap and engine thermostat and replace if required. See section on ENGINE COOLING AND LUBRICATION.
Kinked heater hoses.	Remove kink or replace hose.
Foreign material obstructing water flow in heater core.	Remove foreign material if possible, otherwise replace core.
Temperature control cable improperly adjusted.	Adjust cable.
Air valve does not open.	Check for proper installation and/or adjustment of air control cables.

**INADEQUATE REMOVAL OF FOG OR ICE**

CAUSE	REMEDY
Air door does not open.	Check for proper installation and/or adjustment of air control cable.
Temperature control door does not open.	Check and adjust temperature control cable.
Defroster door does not open fully.	Adjust air control cable.
Obstructions in defroster outlets at windshield.	Remove obstruction.
Blower motor not connected.	Connect wire.
Inoperative blower motor.	Check heater fuse. Replace motor.
Inoperative blower motor switch.	Replace switch.

**TOO WARM IN CAR**

CAUSE	REMEDY
Inoperative temperature control door.	Adjust temperature control cable.
Incorrect operation of controls.	Advise operator of proper operation of heater system.

**BLOWER INOPERATIVE**

CAUSE	REMEDY
Blown fuse.	Replace fuse.
Inoperative motor.	Replace motor.
Open circuit.	Replace circuit between ignition switch, blower switch, and blower motor.
Inoperative blower motor switch.	Replace faulty switch.

**MISCELLANEOUS**

PROBLEM	REMEDY
Control levers not aligned due to incorrect adjustment.	Adjust control cables.
Blown fuses.	Shorts in electrical system. Locate and correct short. Blower wheel rubbing on case. Failed blower motor.
Heater "gurgles".	Check engine coolant level in radiator.

**SPECIFICATIONS**

Heating System Capacity (Engine with Heater) . . . . .	L-6, 11.3 qts. V-8, 20.5 qts.
<b>Fuse Sizes</b>	
Heater Electrical System (on fuse block - special 5/8" fuse) . . . . .	20 amp.
Heater Control Panel Lamp (on fuse block) . . . . .	4 amp.

**PUSH BUTTON RADIO**

**DESCRIPTION**

The all-transistorized Push Button Radio (Fig. 12-7) gives instant response when radio is turned on. Station pick-up and power output are excellent. Current drain is less than half that of manual radios.

The radio is designed to allow manual or push button tuning and has additional advantages of automatic volume control and excellent tone control.

**CAR TROUBLE DIAGNOSIS**

Most radio complaints usually fall into one of three categories; the radio is either dead, weak or noisy. Before removing a radio from the car, a few simple checks can be made in a very short time. In many cases the radio will not need to be removed at all. Refer to the RADIO TROUBLE DIAGNOSIS before removing radio.

If all the diagnosis checks fail to turn up the problem, the condition is in the radio itself. The radio should be removed from the car and sent to an authorized service station. Enclose all pertinent

information, including date of purchase, mileage, customer's name and address and customer's complaint. This information is important to the radio technician and will aid him when making repairs.

**RADIO—REMOVE AND REPLACE (Fig. 12-8 and 12-9)**

1. Remove radio control knobs.
2. Remove retaining nuts and escutcheons.
3. Disconnect antenna and speaker leads.
4. Remove lamp wire assembly (top of receiver on push button models—bottom of receiver on manual radios).

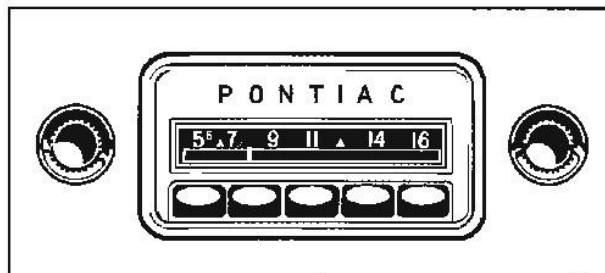


Fig. 12-7 Tempest Radio

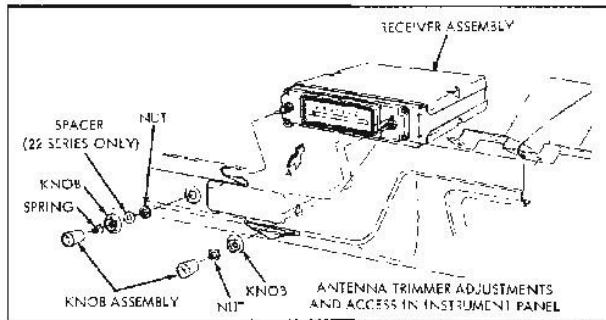


Fig. 12-8 Tempest Radio - Front View - Reference Illustration

5. Remove support to radio bracket bolt and washers and remove radio.

*NOTE: On Custom air conditioned cars it will be necessary to remove the cold air distributor duct.*

#### **SPEAKER—REMOVE AND REPLACE (Fig. 12-10)**

1. Remove speaker and support assembly.
2. Remove screws and nuts securing speaker to speaker support.
3. Disconnect output connector and remove speaker.
4. Reverse above procedure to install.

#### **ADJUST ANTENNA TRIMMER**

In order to make the antenna trimmer adjustment, the car should be outdoors and as far removed from

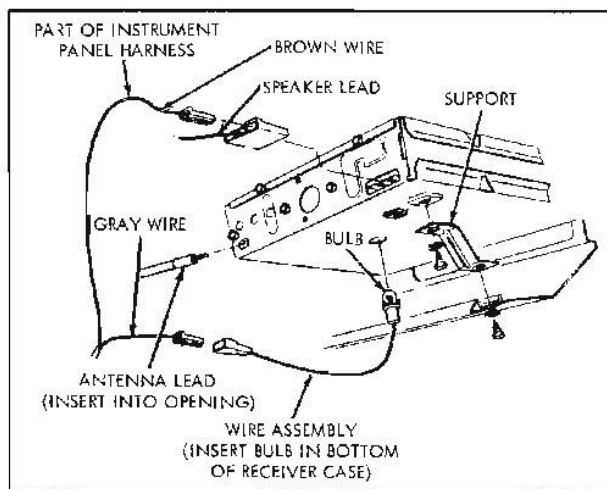


Fig. 12-9 Tempest Radio - Rear View - Reference Illustration

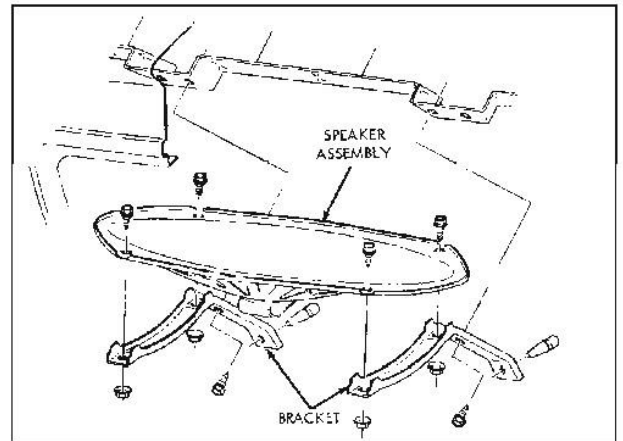


Fig. 12-10 Front Speaker Installation

electrical disturbances as possible. Set the manual antenna to its minimum height and the electric antenna height at 28 inches. Tune in a weak station between 600 and 1000 kilocycles and turn the volume control on full. This is necessary in order to offset the action of the automatic volume control. Using a screwdriver, turn the trimmer adjusting screw located behind the dummy knob on the manual tuning shaft. Turn the screw until the station peaks in volume.

The antenna trimmer adjustment should be made after a set has been removed from the car and worked on by a radio repair man. The reason for trimming the antenna after service work has been performed is that the radio repair man will undoubtedly have adjusted the trimmer to match his antenna so that it no longer matches the antenna in the car from which it was removed.

Trimming the antenna is especially important with the all-transistor radios as this will directly offset sensitivity and selectivity. Complaints of station "mixing" on all-transistor radios can be reduced by this adjustment.

#### **SET RADIO PUSH BUTTONS**

1. Turn radio on.
2. Select five desired stations (set buttons one at a time).
3. Pull selector button out as far as it will go.
4. Tune in the desired station, using the manual control knob.
5. Push the selector button in and release.

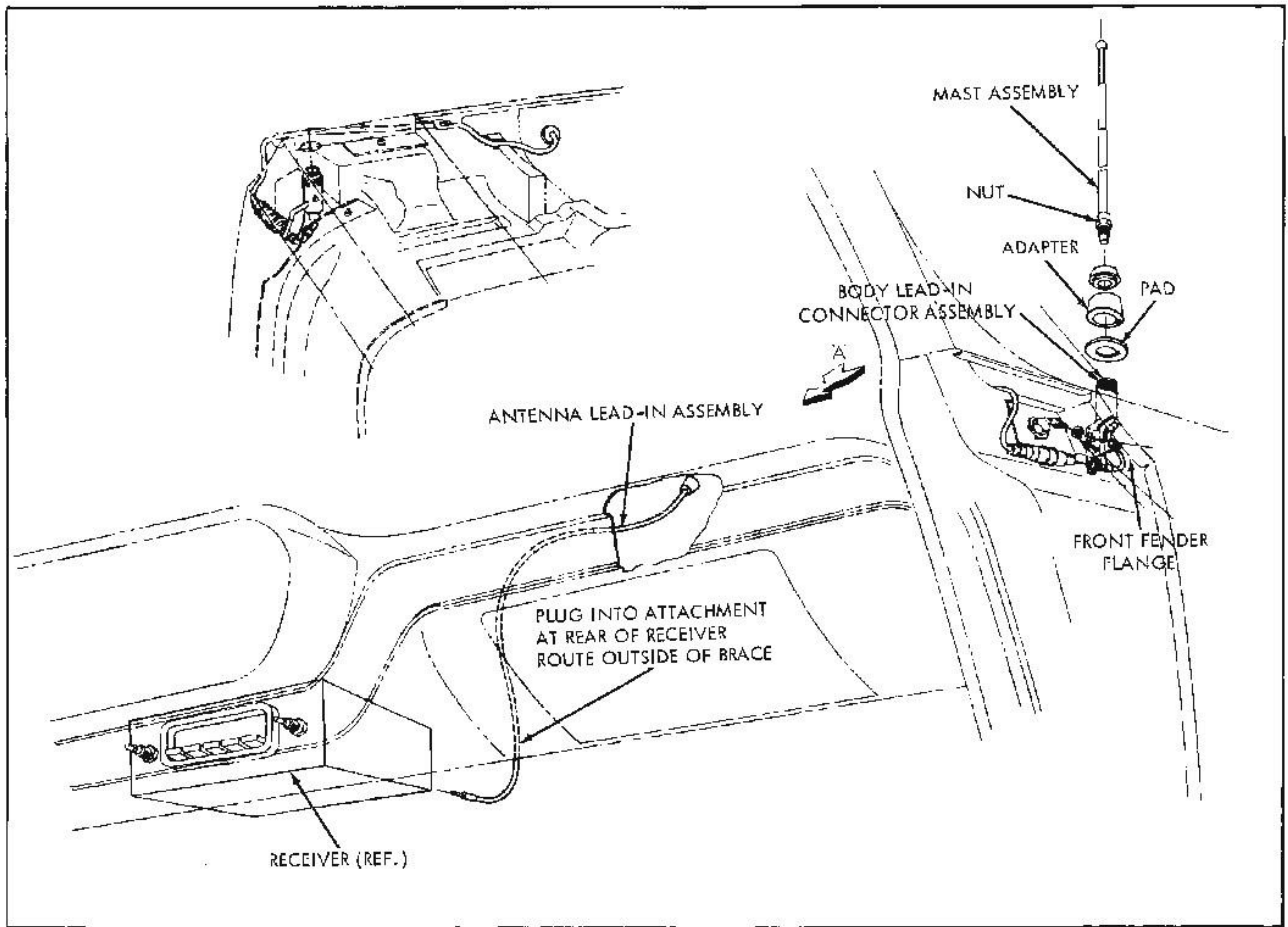


Fig. 12-11 Reference Illustration - Tempest Antenna

### MANUAL ANTENNA

The manual antenna is mounted on the right front fender, in approximately a vertical position (Fig. 12-11).

### PERIODIC SERVICE

Many antenna troubles can be prevented by cleaning the antenna mast at periodic intervals (at least once a month). This is easily performed by wiping the extended mast with a soft cloth when the car is being lubricated or washed.

During the winter months the mast should be lubricated also by wiping it with a cloth containing a light oil.

### ANTENNA BODY—REMOVE AND REPLACE

1. Open right front door.

2. Disconnect antenna lead in from antenna body.
3. Remove screw from antenna mounting bracket.
4. Remove antenna mast.
5. Remove nut, adapter and pad from antenna body.
6. Replace by reversing the above procedure.

### ANTENNA LEAD-IN—REMOVE AND REPLACE

1. Remove glove box.
2. Disconnect lead-in plug from radio receiver (Fig. 12-11).
3. Remove windshield wiper arm.
4. Remove air intake grille.

5. Disconnect the antenna lead-in from antenna body and remove antenna lead-in from vehicle.

6. Replace by reversing the above procedure.

## REAR SEAT SPEAKER

### DESCRIPTION

The radio rear seat speaker system employs a single speaker and is controlled by a lever mounted under the instrument cluster bezel. The speaker is mounted below the package shelf.

Control of the speaker features a circuit design whereby switching a choke coil and condenser in and out of the circuit causes the lower frequency tone to be accentuated in the rear and the high frequency tone in the front.

Operation of the control for ideal sound selection is as follows:

1. Front speaker - full response.
2. Front and rear - Sera-Phonic sound.
3. Rear speaker - full response.

## RADIO TROUBLE DIAGNOSIS

### ALTERNATOR NOISE

Connect capacitor from the "BAT" terminal on the alternator to ground or frame of the car.

### VOLTAGE REGULATOR NOISE

Place capacitor between the "V" terminal of the regulator and chassis.

### BALL ON END OF ANTENNA ROD

Ball eliminates the sharp point and reduces the effect of static discharge. Curb feelers bent too close to ground will cause noise in the auto radio.

### WHEEL STATIC

Caused by voltage being developed as the wheel rotates on the axle. Noise is eliminated by placing

wheel static collectors in the two front wheels; button end of spiral spring must ride snugly in hole or end of axle and be free from grease.

### TIRE STATIC

Caused by electrical charge being built up inside tire due to friction between tire and road. Noise is eliminated by inserting tire static powder into tires using a special injection gun.

*CAUTION: Inject powder carefully or powder will backfire in face.*

## MOST AUTO RADIO COMPLAINTS FALL INTO ONE OF THREE CATEGORIES

### A. Radio Is Dead

1. Thump check radio—turn radio on and listen intently for a distinct "thump" from the speaker which should be heard as current builds up through the power transistor.

- a. If "thump" is heard, go to check (3).
- b. If no "thump", check fuse.

(1) A 2.5 ampere fuse is used in all Pontiac radios. If radio plays, after replacing fuse tap radio with rubber mallet or heel of hand and race the engine; if another fuse blows, remove radio for repair.

(2) If fuse is OK, check all radio interconnecting cables for secure connections. If still no thump, remove radio for repair.

(3) Check antenna by substitution; simply unplug regular antenna and plug in a spare. If radio is still dead, remove for repair.

### B. Radio Is Weak

1. Check to see if antenna trimmer is peaked by tuning to a weak station and grasping antenna rod with hand. If volume drops considerably the trimmer is peaked properly; if the volume remains same or increases slightly, antenna trimmer needs adjusting. Use procedure outlined under ADJUST ANTENNA TRIMMER.

2. If radio is still weak, trimmer does not peak check antenna by substitution.

3. Plug speaker in securely. Make sure speaker is plugged in securely at radio. If radio is still weak, remove the receiver for repair.

### C. Radio Is Noisy

1. Constant noise complaint is almost always due to a defect inside the radio but could be caused by a bad antenna. Check with a substitute antenna.

2. Noise when tapped or jarred, is caused by loose antenna connection to the radio, a poor connection to car's power, poor speaker connection, or a loose part or connection inside the radio.

3. Noisy only when engine is running due to faulty noise suppression equipment.

a. Check antenna lead-in shielding for proper grounding at both antenna base and radio. Poor connections at either of these points can result in engine noise interference.

4. If noise is present only while car is moving, problem is either wheel or tire static, or the result of missing ball at antenna tip.

a. To check for wheel or tire static, drive car on a macadam road until noise is noticed then apply brakes; if noise disappears, it's wheel static; if noise persists, it's tire static.

5. Noisy when car equipment is operated such as directional lights, brake lights, power seat, or power windows.

a. Check to see that lead-in wire is tight and properly seated in radio.

b. Make certain antenna body is grounded to car body.

If all the above checks fail to turn up the problem, the condition is in the radio itself. The radio should be removed from the car and sent to an authorized service station. Include all pertinent information that might help the radio technician repair the radio as quickly as possible.

### ELECTRIC CLOCK

The electric clock operates on direct current from the car battery and must not be compared too closely for accuracy to the home electric clock operating on

alternating current. The cycles per second of alternating current used in the home are controlled and periodically corrected at the power house, thereby eliminating accumulation of errors.

With the direct current system no such control is possible; therefore, automobile electric clocks will accumulate errors day by day the same as hand wound, spring operated clocks.

The electric clock provides automatic regulation of the rate when the position of the hands is changed manually. Moving the hands forward or backward adjusts the length of the hair spring to make the clock run faster or slower. The amount of change in rate depends upon the amount the hands are changed. Maximum rate change is approximately 20 seconds per day and is obtained when the hands are moved five minutes. If the clock is reset less than five minutes the change in rate is proportionally less than 20 seconds.

### SETTING CLOCK

When setting clock to correct for errors in time, pull reset stem out, move hands counterclockwise to correct time if clock is running fast, or move hands clockwise to correct time if clock is running slow, then allow reset stem to return to its normal position. This will automatically adjust the rate of the clock.

Owners should be advised to set the clock to the correct time once a week at regular intervals to ensure maximum accuracy.

### CLOCK—REMOVE AND REPLACE

1. Disconnect power lead and remove lamps at rear of clock.

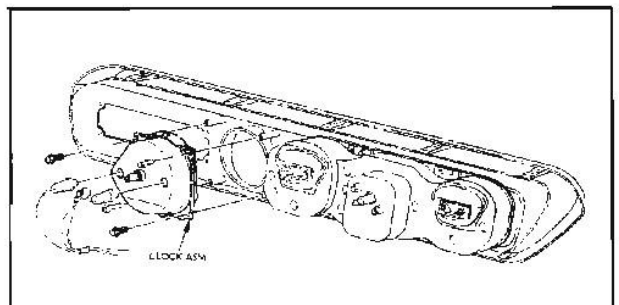


Fig. 12-12 Reference Illustration - Tempest Clock

2. Remove four retaining screws (Fig. 12-12).
3. Remove clock from back of instrument panel.
4. Replace by reversing above procedures.

*NOTE: On custom air conditioned cars it will be necessary to remove the cold air distributor duct.*

### BACK-UP LAMPS

The back-up lamp switch on automatic transmission equipped cars is incorporated in the starter neutralizer switch. This switch is located on the steering column on column shift automatics and in the console on floor shift automatics.

The back-up lamp switch used with vehicles equipped with column shift synchromesh transmissions is mounted on the steering column. Moving the shift lever to the reverse position causes the switch actuating pin in the gearshift lower lever to close the switch, completing the electrical circuit anytime the ignition key is in the ON or ACC position.

The actuating pin should be adjusted to clear the switch by 1/8" when the gearshift lower lever is moved into second gear position.

### TACHOMETER

#### DESCRIPTION

The tachometer is mounted in the right opening of the cluster and bezel assembly, utilizing the same opening usually reserved for electric clock.

This unit indicates the number of engine rpm in hundreds and has an adjustable red pointer which can be moved to any desired position on the dial to indicate pre-determined shift points.

#### TACHOMETER—REMOVE AND REPLACE

1. Disconnect power lead and remove lamps at rear of tachometer.
2. Remove four retaining screws.
3. Remove tachometer from back of instrument panel.
4. Replace by reversing above procedures.

*NOTE: On custom air conditioned cars it will be necessary to remove the cold air distributor duct*

#### RESET TACHOMETER NEEDLE

If it becomes necessary to reset the tachometer a precision tachometer must be hooked up to work in conjunction with assembly in car.

1. Remove cluster and bezel assembly as outlined above, but do not disconnect leads.
2. Connect precision tachometer to assembly in car.
3. Remove round metal plug from rear of tachometer housing.
4. Turn engine over at 3000 rpm as indicated on precision tach (lower or higher readings may result in inaccurate needle setting).
5. Insert small screwdriver through hole at rear of housing and turn rheostat clockwise to lower needle or counterclockwise to raise needle.
6. When proper needle setting has been obtained as indicated on precision instrument, turn engine off, remove precision tachometer and replace unit by reversing removal procedures.